

ABSTRACT

The present invention relates generally to a method for modulating expression of a genetic sequence and to agents useful for same. More particularly, the present invention provides a means for modulating expression of a genetic sequence by introducing, creating or deleting one or more pseudo-translation initiation sites in the nucleotide sequence of an mRNA, upstream, i.e. 5', of the authentic translation initiation site of an open reading frame. The present invention provides further modulation of expression by introducing, creating or removing Kozac or Kozac-like sequences genetically proximal to the pseudo-translation initiation site(s). Modulation of expression is further manipulated by the introduction, creation or removal of a termination signal prior to the authentic translation initiation site or after this site but in a different reading frame relative to the reading frame determined by the authentic translation initiation site. The present invention further provides genetic agents including a plurality of nucleic acid molecules each with a predetermined number of pseudo-translation initiation sites and/or pseudo-open reading frames (ORFs) wherein each sequence influences or otherwise contributes to a particular level of expression for genetic sequences operably linked or associated to the 3' end of said nucleic acid molecules. The level of expression of the genetic sequences is commensurate with a selected nucleic acid molecule which becomes a 5' untranslated or leader region (5'UTR) of said genetic sequence. The present invention still further contemplates a method for detecting a disease condition such as cancer or a proliferative disorder wherein the disease condition is associated with a particular level of expression of a gene or other genetic sequence. Such a method is predicated in part on identifying a particular 5'UTR or 5'UTR-encoding sequence or the level of pseudo-translation initiation sites therein alone or in combination with pseudo-ORFs which provides an indication as to the likely level of expression of said gene or genetic sequences. The ability to modulate the level of expression of a genetic sequence is useful, *inter alia*, for gene therapy applications and for expressing traits at selective levels in plants. Such traits include herbicide and pesticide resistance.